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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,011	12/20/2005	Ashutosh Joshi	0-05-106	9060
42009 7590 03/10/2010 KEVIN D. MCCARTHY ROACH BROWN MCCARTHY & GRUBER, P.C. 424 MAIN STREET 1920 LIBERTY BUILDING BUFFALO, NY 14202				
EXAMINER WONG, EDNA				
ART UNIT		PAPER NUMBER		
1795				
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03/10/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/541,011

**Applicant(s)**

JOSHI ET AL.

**Examiner**

EDNA WONG

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 January 2010 and 20 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4-6, 8 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-6, 8 and 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

This is in response to the Amendment dated January 19, 2010 and Supplemental Amendment dated January 20, 2010. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

***Response to Arguments***

Claim Objections

Claim 1 has been objected to because of minor informalities.

The objection of claim 1 has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

Claims 1, 4-6, 8 and 11-16 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regards to claim 8, the rejection under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

With regards to claim 1, the rejection under 35 U.S.C. 112, second paragraph, is as applied in the Office Action dated November 24, 2009 and incorporated herein. The rejection has been ***maintained*** for the following reasons:

Claim 1

line 2, it is unclear whether "a liquid aqueous biocidal mixturess" is singular or

plural.

Please delete the letter "s" from the word "mixtures". See claim 1, lines 6-7 and 9-12.

Claim Rejections - 35 USC § 103

Claims **1, 4-6, 8 and 11-16** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **CS 274995** ('995) in combination with **Nakamura** (US Patent No. 6,194,821 B1) and **Jen et al.** ("Determination of Hydroxyl Radicals in an Advanced Oxidation Process with Salicylic Acid Trapping and Liquid Chromatography", *J. of Chrom. A*, Vol. 796 (1998), pp. 283-288).

The rejection of claims 1, 4-6, 8 and 11-16 under 35 U.S.C. 103(a) as being unpatentable over CS 274995 ('995) in combination with Nakamura and Jen et al. is as applied in the Office Action dated November 24, 2009 and incorporated herein. The rejection has been ***maintained*** for the following reasons:

Applicants state that the Examiner has accepted the conclusions of an expert in radical chemistry, who explained in said declaration that magnesium cannot replace transition metals in catalytic process.

In response, the Examiner accepts that the thermal decomposition of hydrogen peroxide and the photocatalytic decomposition of hydrogen peroxide would not have been obvious to combine. The Examiner does not accept that magnesium cannot replace transition metals in catalytic process because Nakamura teaches that:

As the catalyst gas 86 or powder, it is preferable to use that of titanium oxide, magnesium oxide or the like, and the titanium in the titanium oxide or the magnesium in the magnesium oxide attacks the bonded part of C-Cl in particular so that the bonded part of that is cut easily (col. 7, lines 1-5).

Nakamura teaches that titanium oxide (a transition metal oxide) and magnesium oxide possess the same abilities. Thus, substituting the transition metal catalysts in CS '955 with the magnesium oxide (MgO) in Nakamura would have accomplished what CS '995 proposed, and would not have destroyed what CS '995 wants to do, absent evidence to the contrary.

Applicants state that the Nakamura reference, in the applicant's opinion, relates still less than Parrish to the instant technique, as well as to the technique of CS '995. Whereas Parrish related to MgO and peroxide, Nakamura does not even mention peroxide. The instant technique comprises MgO, peroxide and UV; although the Examiner initially believed that Parrish related to all three of these items, it turned out that Parrish related only to MgO and peroxide without UV, and now a new citation is brought up that relates to MgO and UV without peroxide.

In response, the rejection is not overcome by pointing out that one reference does not contain a particular limitation when reliance for that teaching is on another reference. *In re Lyons* 150 USPQ 741 (CCPA 1966). Moreover, it is well settled that one cannot show nonobviousness by attacking the references individually where, as here, the rejection is based on a combination of references. *In re Keller* 208 USPQ 871 (CCPA 1981); *In re Young* 159 USPQ 725 (CCPA 1968).

Applicants state that the experimental examples show that the presence of hydrogen peroxide was not essential for the process, and sometimes it even lowered the efficiency of the degradation process.

In response, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP § 2123 (II)).

Applicants state that:

	Instant invention	CS995
Purpose	enhanced formation of radicals from hydrogen peroxide	degradation of EDTA, benzoate, or phenol
Reaction substrates	inorganic materials $H_2O_2$ , $O_2$	organic substrates EDTA, benzoate, or phenol, and $O_2$
Catalysis type	heterogeneous (oxide suspension) and UV	homogeneous (soluble salts) and UV
Catalyst metal	Mg	transition metal
pH	alkaline	?
Radicals situation	radicals cumulated to be quantified	no radicals
Use of the reaction mixture	treating ballast water or waste waters (pp 5-7)	no use

In response,

	Instant invention	CS995
Purpose	enhanced formation of radicals from hydrogen peroxide	<b>MPEP 2144</b>
Reaction substrates	inorganic materials $H_2O_2$ , $O_2$	<b>no claim basis <math>H_2O_2</math>, <math>O_2</math></b>
Catalysis type	heterogeneous (oxide suspension) and UV	<b>From Nakamura</b>
Catalyst metal	Mg	<b>Mg from Nakamura</b>
pH	alkaline	<b>Inherent</b>
Radicals situation	radicals cumulated to be quantified	<b>MPEP 2116,01</b>
Use of the reaction mixture	treating ballast water or waste waters (pp 5-7)	<b>Intended use, no claim basis</b>

Applicants state that instant claim 1 discloses a method for enhancing the generation of hydroxyl radicals in an aqueous environment, at a neutral or basic pH, via the combination of hydrogen peroxide, oxygen, MgO, and UV. Therefore, it is clear to a person skilled in art that the technical problem to be solved is not immediate degradation of organic compounds but rather a way to enhance the generation of hydroxyl radicals in an aqueous environment, knowing the limitations of the prior art techniques, said radicals to be later applied in the purification of ballast water or waste water.

In response, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert.*

*denied*, 500 US 904 (1991); and MPEP § 2144.

Applicant state that Nakamura does not teach the generation of hydroxyl radicals via said catalyst.

In response, the CS '995 combination teaches similar method steps as presently claimed (*i.e.*, *supplying, supplying, adjusting, irradiating and mixing*). Similar processes can reasonably be expected to yield products which inherently have the same properties. *In re Spada* 15 USPQ 2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 195).

Furthermore, the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that the passages cited by the examiner show that a) Nakamura does not relate to liquid-solid heterogeneous catalysis, and b) Nakamura teaches either degrading chlorinated organic compound with the help of Mg-atom, or the formation of radicals via UV without any metal presence. No participation of MgO in an inorganic



reaction resulting in the radical formation is implied.

In response, Nakamura teaches that:

A decomposition method for decomposing an organic compound of the present invention may be used in the decomposition apparatus described above, and comprises steps of flowing a fluid which is selected from a gas of an organic compound, a liquid thereof, a gas containing an organic compound and a liquid containing an organic compound during the emission of a UV light which is irradiated from the excimer lamp, and decomposing the organic compound in fluid during its flowing. In this case, it is preferable that the fluid flows slowly in a flow rate buffering material during the emission of UV light. And, it is preferable that the fluid contacts a catalyst for promoting the decomposition of an organic compound during the emission of UV light. The organic compound used may be selected from flon, dioxin (polychlorinated dibenzo-para-dioxin), PCB (polychlorinated biphenyl), trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane, 1,2-dichloroethane, 1,1-dichloroethane, cis-1,2-dichloroethane, 1,1,1-trichloroethane, 1,3-dichloropropene and the mixture thereof. It is preferable that the UV light of wave length of 222 nm or below may suitable be used (col. 2, lines 37-57).

A liquid of the organic compound or a liquid containing the organic compound is the liquid and magnesium oxide (MgO) would have been the catalyst for promoting the decomposition of the organic compound during the emission of UV light because it is a positively recited catalyst in the reference.

Applicants state that that Nakamura neither teaches nor suggest that MgO can be used as a photocatalyst in a reaction in an aqueous phase, aiming to generate hydroxyl radicals.

In response, the rejection is not overcome by pointing out that one reference does not contain a particular limitation when reliance for that teaching is on another reference. *In re Lyons* 150 USPQ 741 (CCPA 1966). Moreover, it is well settled that one

cannot show nonobviousness by attacking the references individually where, as here, the rejection is based on a combination of references. *In re Keller* 208 USPQ 871 (CCPA 1981); *In re Young* 159 USPQ 725 (CCPA 1968).

The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991); and MPEP § 2144.

Applicants state that it would be evident to a skilled person, that Nakamura's reaction for decomposing polychlorinated organic compounds has not much in common with either CS '995 or with the instant technique (compare with the table in par. 6 above); instead of regular reactor and UV, Nakamura employs discharging vessel provided with electrodes, and UV laser (Summary).

In response, Nakamura is used in the Examiner's rejection for the teaching of magnesium oxide. Nakamura teaches that titanium oxide (a transition metal oxide) and magnesium oxide possess the same abilities. Thus, substituting the transition metal catalysts in CS '955 with the magnesium oxide (MgO) in Nakamura would have accomplished what CS '995 proposed, and would not have destroyed what CS '995 wants to do, absent evidence to the contrary.

Applicants state that a person skilled in the art would not have any reason to combine Nakamura with CS '995, and even if incidentally combining these two techniques, said skilled person would have never expected, without the benefice of hindsight, that a suspension of MgO powder, in an aqueous environment, would work as a catalyst for the generation of hydroxyl radicals from hydrogen peroxide.

In response, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering the problem (MPEP 2141.01(a)).

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edna Wong/  
Primary Examiner  
Art Unit 1795

EW  
February 27, 2010